

Name: _____

Per: _____

Reading Outline 11.3 Acceleration

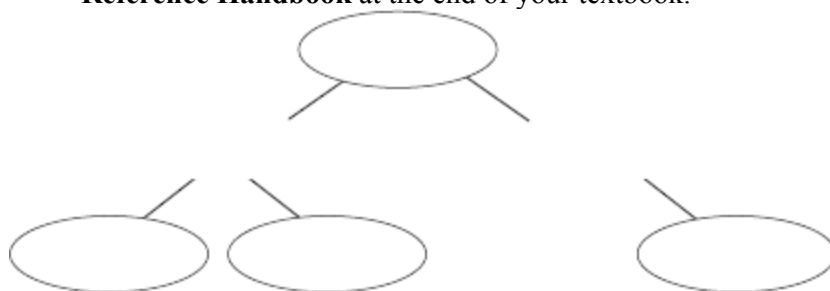
(pages 342–348)

This section describes the relationships among speed, velocity, and acceleration. Examples of these concepts are discussed. Sample calculations of acceleration and graphs representing accelerated motion are presented.

Reading Strategy (page 342)

Summarizing:

1. **Read** the section on acceleration.
2. **Then complete the concept map** to organize what you know about acceleration.
3. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.



What Is Acceleration? (pages 342–345)

1. The rate at which velocity changes is called _____
2. In terms of speed and direction, in what ways can an object accelerate?
 - a. _____
 - b. _____
 - c. _____
3. Because acceleration is a VECTOR quantity it includes (circle all that apply)
 - a. a magnitude (number or an amount)
 - b. units
 - c. a direction
4. Is the following sentence true or false? Acceleration is the result of increases or decreases in speed. Explain:
5. Ignoring air resistance, if a rock is in free fall after being dropped, what velocity will it have after 4.0 seconds? (Hint: what is the acceleration you need to consider?) Show all work.

| | | | | | |
|----|-------|-------|-------|-------|-------|
| t: | 0 sec | 1 sec | 2 sec | 3 sec | 4 sec |
|----|-------|-------|-------|-------|-------|

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v : _____

Final Velocity: _____

6. A horse on a carousel that is moving at a constant speed is accelerating because:

7. Describe constant acceleration.

Calculating Acceleration (pages 345–346)

8. Write the equation used to calculate the acceleration of an object.

a = ----- = -----

in words

in symbols

9. Is the following sentence **true or false**?

When the final velocity is less than the initial velocity of an object, the acceleration is negative. **Explain.**

10. A skateboarder begins down a ramp at a speed of 1.0 m/s. After 3 seconds, her speed has increased to 4.0 m/s. Calculate her acceleration. Show your work.

a. 1.0 m/s²

b. 3.0 m/s²

c. 5.0 m/s²

d. 9.8 m/s²

Graphs of Accelerated Motion (pages 346–348)

Match the description of a line on a velocity versus time graph with the appropriate meaning of that line.

11. A speed-time or velocity-time graph in which the data forms a straight, horizontal line at a non-zero location on the y-axis

a. Increasing velocity

12. A speed-time or velocity-time graph in which the displayed data forms a constant positive slope

b. Decreasing velocity

13. A speed-time or velocity-time graph in which

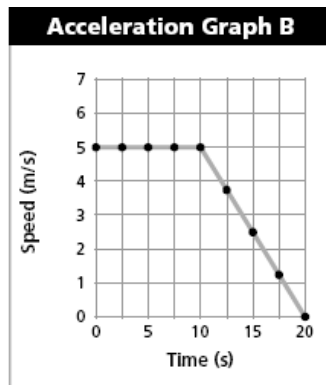
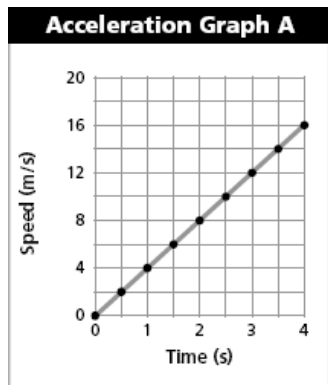
c. Constant velocity

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the displayed data forms a constant negative slope

For questions 12 through 15, refer to the graphs below.



14. Graph A represents the motion of a downhill skier.

How fast was the skier moving after traveling down the hill for 2.5 seconds? _____

15. In which graph does an object move at constant speed during the first 4 seconds?

Circle your answer :

Graph A

Graph B

16. Graph B represents the motion of a mountain biker.

What is the biker's speed at the time 10 s ? _____

What is the biker's speed at the time 20 s? _____

17. Determine the acceleration of the mountain biker during the 10 second to 20 second time period. **Show your work.**

18. The plotted data points representing acceleration in a distance-time graph form a _____.

Instantaneous Acceleration (page 348)

19. The measure of how fast a velocity is changing at a specific instant is known as _____.